REMARKS

I. CLAIM OBJECTIONS

At page 2 of the Office action, the Examiner has objected to claim 1 because it has two periods at the end of the claim, and has objected to claim 5 because it is missing a period at the end of the claim. By the present amendment, Applicants have taken the extra period from claim 1 and placed it at the end of claim 5. Accordingly, the Examiner's objection should be withdrawn.

II. OBVIOUSNESS REJECTION OVER OLDS ET AL.

At pages 2-3 of the Office action, the Examiner has rejected claims 1-13 under 35 U.S.C. § 103(a) as obvious over Olds et al. (U.S. Patent No. 5,714,421). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The Examiner alleges that Olds et al. disclose fiber compositions having ranges that overlap the fiber compositions recited in Applicants' claims. Specifically, the Examiner points to the Abstract of Olds et al. (which does not disclose any ranges), to column 3, lines 9-25, and to claims 1 and 3.

Applicants respectfully submit that the Examiner has failed to establish a prima facie case of obviousness because none of the passages cited by the Examiner teach or suggest fiber compositions where the mole percent of magnesium oxide is greater than the mol percent of calcium oxide. Nowhere is such a relationship explicitly mentioned in Olds et al.; accordingly, there is no suggestion in Olds et al. that the relative mole percentages of these components is a recognized result effective operating parameter. Moreover, to the extent that any teaching can be gleaned from

Olds et al. about the relative mole percentages of these oxides, it is a teaching away from Applicants' claimed invention.

A review of the fiber compositions exemplified in Olds et al. that meet the claimed ranges for weight percents of silica, calcia, and magnesia gives the results shown in the table below. None of these fiber compositions contain molar percentages of magnesia larger than the mole percentages of calcia. In fact, the molar percentage of calcia is approximately twice as large as the molar percentage of magnesia. Applicants respectfully submit to the extent that a worker having ordinary skill in this art was even interested in the relative molar percentages, this worker would more reasonably look to the examples of Olds et al. for guidance, rather than randomly pick compositions from within the Olds et al. ranges that just happen to fit the claims. This would result in the worker selecting fiber compositions that, like the Olds et al. examples, contain molar percentages of calcia that are larger than the molar percentages of magnesia.

The improbability that one of ordinary skill in this art would disregard the teachings of the Olds et al. examples and, absent either religious epiphany or blinding insight, stumble upon the combination of compositional parameters recited in the claims is further underscored by relatively small nature of the universe of fiber compositions claimed relative to the universe of fiber compositions disclosed in the broad Olds et al. ranges upon which the Examiner relies. The selection of the claimed combination of fiber compositional limitations is not mere gerrymandering to avoid prior art, but rather the result of careful selection to provide fibers having maximum

use temperatures higher than those described in Olds et al. This, also, is recited in Applicants' claims.

Fibre No.	w%B_2O_3	mol B_2O_3	w%SiO_2	mol SiO_2	m%SiO_2	w%Al_2O_3	mol Al_2O_3	w%Fe_2O_3	molFe_2O_3	w%MgO	molMgO	m%MgO	w%CaO	mol CaO	m%CaO
164	0.32	0.004598	64.8	1.078203	60.99883	0.06	0.000588	0	0	8.7	0.215881	12.21336	26.6	0.46831	26.49441
156	0.64	0.009195	64.6	1.074875	60.82745	0.06	0.000588	0	0	8.7	0.215881	12.21675	26.5	0.466549	26.40214
167	0.82	0.011782	64.5	1.073211	60.70161	0.06	0.000588	0	0	8.7	0.215881	12.21038	26.5	0.466549	26.38837
194	0	0	64.9	1.079867	61.16431	0.06	0.000588	0.06	0.000376	8.72	0.216377	12.25573	26.6	0.46831	26.52535
197	0	0	64.34	1.070549	61.78833	0.06	0.000588	0.5	0.003133	7.8	0.193548	11.17093	26.4	0.464789	26.82597
201	0	0	64.3	1.069884	60.97331	0.06	0.000588	0.96	0.006015	8.6	0.2134	12.16177	26.4	0.464789	26.48859
217	0	0	64.7	1.076539	60.9649	0.06	0.000588	0	0	8.7	0.215881	12.22543	26.6	0.46831	26.5206
218	0	0	64.5	1.073211	60.85731	0.06	0.000588	0	0	8.7	0.215881	12.2417	26.5	0.466549	26.45605
219	0	0	64.4	1.071547	60.7613	0.06	0.000588	0	0	8.6	0.2134	12.10066	26.5	0.466549	26.45533
221	0	0	64.3	1.069884	60.86985	0.06	0.000588	0	0	8.5	0.210918	11.99996	26.2	0.461268	26.24332

The selection of fiber compositions having the combination of compositional limitations and maximum use temperature recited in Applicants' claims can thus only be the result of the impermissible use of hindsight, based on Applicants' claims as a template. It is well established by now that this is not the appropriate standard to apply when evaluating obviousness. Because there is no teaching or motivation within Olds et al. to select the claimed compositions, and because Olds et al. itself teaches away from Applicants' claims, the Examiner has not established a prima facie case of obviousness, and this rejection should be withdrawn.

III. OBVIOUSNESS REJECTION OVER IWAI

At pages 3-4 of the Office action, the Examiner has rejected claims 1-13 under 35 U.S.C. § 103(a) as obvious over the Derwent abstract of Iwai (JP 51-13819). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The disclosure upon which the Examiner relies is only a single paragraph, yet still manages to teach away from Applicants' claimed invention. As with Olds et al., there is absolutely no suggestion to form a fiber having a molar percentage of magnesia larger than the molar percentage of calcia. In addition, the fiber disclosed in Iwai is for use as reinforcement in concrete, not as high temperature insulation. As a result, its composition is driven by the need to resist the alkaline conditions encountered in the cement, rather than by the need to withstand high use temperatures. There is no teaching or suggestion in Iwai that the compositions disclosed therein would have high maximum use temperatures, as recited in Applicants' claims.

The Examiner has failed to explain why one of ordinary skill in the art of preparing concrete reinforcing fibers would select fiber compositions wherein the molar percentage of magnesia is larger than the molar percentage of calcia; as a result, the Examiner has failed to establish a prima facie case of obviousness. Moreover, because the disclosure of Iwai leads one of ordinary skill in the art toward compositions having high alkali resistance rather than toward compositions having high maximum service temperatures, Iwai teaches away from Applicants' invention, and again the Examiner has failed to establish a prima facie case of obviousness. For these reasons, the rejection should be withdrawn.

IV. OBVIOUSNESS REJECTION OVER JUBB ET AL.

At pages 4-5 of the Office action, the Examiner has rejected claims 1-13 under 35 U.S.C. § 103(a) as obvious over Jubb et al. (U.S. Patent No. 5,994,247). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The Examiner points to column 4, lines 18-32, alleging that the ranges disclosed in Jubb et al. overlap those of the claims, rendering the claimed fiber compositions obvious to one of ordinary skill in the art. However, as with the other references that the Examiner cites, Jubb et al. does not contain any explicit disclosure of fiber compositions where the molar percentage of magnesia is greater than the molar percentage of calcia and in which the silica excess is no greater than 21.8 mole percent. As with Olds et al., the exemplified fibers disclosed in Jubb et al. teach away from these ranges. Of all the exemplified fiber compositions disclosed by Jubb et al., only fiber A2-5 appears to meet the limitations of the claims regarding weight

percentages of silica, calcia, and magnesia, and appears to have a mole percentage of magnesia slightly larger than the mole percentage of calcia (although it is not clear that this is not the result of experimental or calculational error). However, the molar excess of silica for this fiber (molar percentage of silica remaining after crystallization of CaO, MgO, and ZrO_2 as silicates) is well above the maximum of 21.8%. To make this more plain, the composition of fiber A2-5 in Jubb et al. was taken as given. Assuming 100 g of fiber, molar amounts of the fiber components were calculated to be as follows:

SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	ZrO_2
1.093	0.0018	0.00063	0.342	0.330	0.0026	0.00114

As described at page 2 of the specification, excess silica is calculated by first assuming that all calcia is bound as $CaO.MgO.2SiO_2$. Thus two moles of silica are subtracted from the total for every mole of calcia present, leaving 0.433 moles of silica. The remaining magnesia (0.012 moles) is then assumed to be bound as $MgO.SiO_2$, leaving 0.421 moles silica. Zirconia is assumed to be bound as $ZrO_2.SiO_2$, leaving 0.420 moles silica. Alumina is assumed to be bound as $Al_2O_3.SiO_2$, leaving 0.418 moles silica. Using the total moles of material (1.77117 moles) as the basis, the molar percentage of excess silica is thus calculated to be 23.6%, a clear 2% above the maximum permitted by the claims. As the Examiner is no doubt aware, small changes in fiber composition can have significant changes in fiber properties.

First, Applicants note that the Jubb et al. disclosure does not identify either the relative calcia-magnesia molar percentages or the molar excess of silica as result-effective operating parameters. Moreover, these claimed ranges are not random or engineered to avoid prior art, but rather to provide fiber compositions having high maximum service temperatures, as recited in Applicants' claims. To the extent that one of ordinary skill in the art would have been motivated to prepare fibers and analyze these parameters, it seems much more reasonable for this worker to be guided by the exemplified fiber compositions, rather than randomly selecting fiber compositions that fall within the broad ranges of Jubb et al.

Since the only fiber composition disclosed in Jubb that even remotely approximates most of the compositional limitations in Applicants' claims completely fails to meet the excess silica requirement, and in fact has a significantly higher excess silica requirement than that permitted by the claims, one of ordinary skill in this art would reasonably have been motivated to use the higher excess silica amount disclosed for fiber A2-5 when using fibers where the molar percentages of calcia and magnesia are similar. Because this silica amount is well outside Applicants' claimed range, Applicants respectfully submit that the Examiner has failed to establish a prima facie case of obviousness.

CONCLUSION

Applicants respectfully submit that the art cited by the Examiner discloses fiber compositional ranges that are so wide relative to the claimed ranges, that one of ordinary skill in this art would not reasonably have been expected to select the particular subgenus encompassed by the claims without more guidance from the

references. Moreover, this worker would certainly not have expected that by selecting the claimed subgenus, a fiber composition would be obtained that possesses high maximum service temperatures. In light of the Examiner's failure to establish a prima facie case of obviousness, Applicants respectfully submit that this application is in condition for immediate allowance, and an early notification to that effect is earnestly solicited.

The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Order Account No. 11-0855.

Respectfully submitted,

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